

WHAT IS CLAIMED IS:

1. A treatment method for providing a substance to be absorbed onto a surface of a patient's skin, comprising:  
a) applying the substance onto the surface of the patient's skin by way of a probe head that provides, at the same time: i) bursts of electrical pulses to the skin surface, and ii) vibrations to the skin surface,

wherein the vibrations are applied to the skin surface at substantially a same frequency rate, a first harmonic of the same frequency rate, and/or a second harmonic of the same frequency rate, as a burst rate of electrical pulses being applied to the skin surface.

2. The treatment method according to claim 1, wherein the applying of the bursts of electrical pulses comprises:

a1) obtaining exponentially-shaped pulses having opposite polarity with respect to adjacent ones of the exponentially-shaped pulses; and

a2) outputting the exponentially-shaped pulses in bursts of electrical pulses.

3. The treatment method according to claim 1, further comprising, prior to applying the substance to the patient's skin:

heating the surface of the patient's skin by one of: i) a radio frequency signal, and ii) a lamp,

wherein the treatment method is for reducing cellulite or fatty tissue disposed beneath the surface of the patient's skin.

4. A device for treating a patient by applying a substance to a patient's skin, comprising:

a probe configured to apply the substance to the patient's skin;

an electrical signal pulse generator configured to generate bursts of electrical pulses at a first burst rate;

a mechanical vibration generator configured to generate a mechanical vibration at a first vibration rate;

a vibration plate disposed on the probe and coupled to the mechanical vibration generator, the vibration plate configured to provide the mechanical vibration to the patient's skin; and

a plurality of electrodes disposed on the probe and coupled to the electrical signal pulse generator, the plurality of electrodes configured to provide the bursts of electrical pulses to the patient's skin,

wherein the first burst rate is the same or substantially the same as the first vibration rate.

5. The treatment device according to claim 4, wherein the first vibration rate is within 10 % of the first burst rate, or within 10 % of a first, second or third harmonic of the first burst rate.

6. The treatment device according to claim 4, further comprising:

a radio frequency generator configured to generate a radio frequency signal at a fixed radio frequency; and

means for applying the radio frequency signal to the patient's skin.

7. The treatment device according to claim 4, wherein each of the bursts of electrical pulses comprises a plurality of pulses in which

adjacent ones of said plurality of pulses are of opposite polarity with respect to each other.

8. A treatment method for enhancing absorption of substances provided on a skin surface of a patient, comprising:

a) applying a dermabrasion treatment to a region of the skin surface by way of a dermabrasion apparatus;

b) thereafter, applying a substance to the skin that is intended to be absorbed within the skin;

c) applying a vibration to the skin of between 10 to 200 Hz; and

d) applying a sequence of bursts of electrical pulses at a frequency between 50 to 15,000 Hz and peak voltage between 5 and 200 V to an array of electrodes that are placed on the skin,

wherein the sequence of bursts of electrical pulses and the vibration are provided to the skin at a same time in order to enhance absorption of the substance applied to the skin.

9. The treatment method according to claim 8, further comprising:

e) applying a vacuum to the skin when performing steps b) and c), in order to provide a substantially uniform absorption of the substance within the skin.

10. The treatment method according to claim 8, wherein the electrodes are parallel metallic stripes that are alternately connected to each other and that are provided on an outer surface of a vibrating plate.

11. The treatment method according to claim 8, wherein the electrodes are round electrodes alternately electrically connected to each other and that are provided on an outer surface of the vibrating plate.

12. The treatment method according to claim 8, wherein a D.C. current is applied between the electrodes and a ground plate connected to the patient.

13. The treatment method according to claim 8, wherein the applying step b) is accomplished by dispensing of liquid or gel or cream or lotion by way of a roller integrated in the probe.

14. The treatment method according to claim 13, wherein a D.C. current is applied between the electrodes and a plate connected to the patient.

15. A device for treating a patient, comprising:  
a dermabrasion unit configured to dermabrade a portion of the patient's skin so as to remove a top skin layer from the patient's skin;  
a probe configured to apply a substance to the patient's skin;  
a vibration unit configured to apply vibrations to the portion of the patient's skin at a first vibration frequency; and  
an electrical pulse burst unit configured to apply bursts of electrical pulses at a first burst rate to the portion of the patient's skin  
wherein the bursts of electrical pulses and the vibrations are provided to the portion of the patient's skin at a same time in order to enhance absorption of the substance applied to the skin by way of the probe.

16. The treatment device according to claim 15, further comprising:

a vacuum unit configured to apply a vacuum to the portion of the patient's skin so as to suck the portion of the patient's skin towards the probe when the bursts of electrical pulses and the vibrations are provided to the portion of the patient's skin.

17. The treatment device according to claim 15, further comprising:

a plurality of electrodes provided on a skin-facing surface of the probe, the plurality of electrodes communicatively coupled to the electrical pulse burst unit.

18. The treatment device according to claim 17, wherein the electrodes are round electrodes alternately electrically connected to each other and that are provided on an outer surface of the probe.

19. The treatment device according to claim 15, further comprising:

at least one roller provided on the probe and configured to roll on the portion of the patient's skin.

20. The treatment device according to claim 19, further comprising:

a radio frequency generator unit configured to generate a radio frequency signal at a fixed radio frequency; and

a coaxial cable configured to deliver the radio frequency signal to the at least one roller,

wherein the radio frequency signal is between 1 MHz and 27 MHz and is used to heat a region within the patient beneath the portion of the patient's skin.

21. A method for reducing cellulite on skin, comprising:

- a) applying a dermabrasion treatment to a region of the skin;
- b) heating the skin by way of a lamp or a radio frequency signal;
- c) applying mechanical vibrations to the region of the skin by way of a probe; and
- d) applying electrical pulses to the region of the skin, by way of the probe, at a same time the mechanical pulses are applied to the region of the skin in step c).

22. The method according to claim 21, further comprising;

- e) concurrently with steps c) and d), generating a suction at the probe to suck at least a portion of the region of the skin towards the probe while the probe is being moved along the region of the skin.

23. The method according to claim 22, further comprising:

between steps b) and c), applying a cellulite-reducing substance to the skin,

wherein the vibrating applying step enhances absorption of the substance within the skin, and

wherein the suction generating step evenly distributes the substance within the skin.

24. A device for reducing cellulite of a patient, comprising:  
a dermabrasion unit configured to treat a portion of the patient's skin by removing a stratum corneum layer of the portion of the patient's skin;  
means for heating a region of the patient beneath the portion of the patient's skin by way of a lamp or a radio frequency signal;  
a probe configured to deliver a substance to the portion of the patient's skin to reduce the cellulite beneath the portion of the patient's skin;  
a vibration unit configured to apply mechanical vibrations to the portion of the patient's skin; and  
a electrical pulse burst applying unit configured to apply bursts of electrical pulses to the portion of the patient's skin,

wherein the burst of electrical pulses are applied to the portion of the patient's skin at a same time the mechanical pulses are applied to the portion of the patient's skin and at a same time the portion of the patient's skin is being heated.

25. The device according to claim 24, further comprising;  
a suction unit configured to generate a suction at the probe to suck the portion of the patient's skin towards the probe while the probe is being moved along the patient's skin.

26. A treatment method for providing a substance to be absorbed onto a surface of a patient's skin, comprising:  
a) fitting an attachment device to a probe head that has electrodes provided on an end face and wherein the probe head is capable

of mechanically vibrating, the attachment device having a plurality of openings respectively positioned above the electrodes with a plurality of absorbing units with a drug soaked thereon provided in the plurality of openings; and

b) applying the drug onto the surface of the patient's skin by way of the probe head that provides at least one of: i) electrical pulses to the skin surface by way of the electrodes, and ii) mechanical vibrations to the skin surface by way of the mechanically vibrating probe head, in order to cause absorption of the drug within the patient's skin.

27. The treatment method according to claim 26, wherein the plurality of absorbing units are at least one of: sponges, hydrogel pads, and gauze pads.

28. An apparatus for transdermal delivery of a drug to a patient's skin, comprising:

a probe having a head with a plurality of electrodes disposed thereon;

a vibrating plate provided adjacent to the head of the probe;

an attachment device having a plurality of openings therein that is configured to be detachably attached to the head of the probe; and

a plurality of absorbing units configured to respectively fit within the plurality of openings of the attachment device, the plurality of absorbing units being soaked with the drug to be applied to the patient's skin;

a pulse generator provided in the probe and configured to deliver bursts of electrical pulses to the plurality of electrodes; and

a vibrating unit provided in the probe and configured to cause the head of the probe to mechanically vibrate.



29. The apparatus according to claim 5, wherein the plurality of absorbing units are at least one of: gauze pads, hydrogel pads, and sponges.